



Montana Department of Transportation  
PO Box 201001  
Helena, MT 59620-1001

**Construction Memorandum**

To: Distribution

From: Paul Jagoda, P.E.  
Construction Engineering Services Engineer

Date: August 5, 2005

Subject: Review Process for Crashworthy Requirements for Work Zone Devices

Attached is the subject process the department will use to determine the acceptability of work zone devices, not commercially manufactured, for crashworthiness and use on MDT contracts.

Please contact Mark Baum or myself if you require additional information.

Distribution

District Administrators  
Matt Strizich, P.E., Materials Bureau  
Mark Wissinger, P.E., Construction Engineer  
Paul Ferry, P.E., Pre-construction Design Engineer  
Suzy Althof, Supervisor, Contract Plans  
District Engineering Services Supervisors  
District Construction Engineers  
Duane Williams, PE

## Crashworthy Work Zone Traffic Control Device Submission Process 8-5-05

**Introduction:** To assure work zone traffic control devices used on MDT construction projects meet NCHRP 350 crashworthy requirements the department will use the following process to review and approve contractor submissions on work zone traffic control devices.

**General.** Before a contractor submits information on work zone traffic control devices it is recommended that the contractor visit FHWA's web site; Questions and Answers About Crash testing of Work Zone Safety Appurtenances at <http://safety.fhwa.dot.gov/roadway>

Many of the devices previously tested and accepted by FHWA have patented components and therefore are proprietary. For devices crash tested at the expense of a private company, a vendor may use the acceptance letter written to the company that had the devices tested only if they: (a) purchase the devices from that company that paid for the crash testing (or another authorized distributor), or (b) obtain permission from that company to reproduce their design.

For commercially manufactured traffic control devices the contractor is to submit the manufacturer's certification to the project manager as required in the contract special provisions.

For traffic control devices not manufactured commercially and that have not been crash tested meeting NCHRP 350 requirements, the manufacturer of the work zone device is to submit the following information to the Montana Department of Transportation, Construction Engineering Services Bureau, attention Paul Jagoda.

Reference to identical design as used here means a device that is physically and materially the same as another device that has been certified or successfully crash tested. These devices are generic in design and have no proprietary elements in their design. Reference to nearly identical, as used here, means a device that is similar physically and materially to a device that has been successfully crash tested but the device differs enough that an engineering analysis, by an engineer specializing in this area of expertise, is required to determine its crashworthiness.

All devices not meeting either of the above statements and that are not commercially made and crash tested will require being successfully crash tested meeting NCHRP 350 requirements and furnishing the department the test results. All work zone traffic control devices are required to meet the current edition of the Manual on Uniform Traffic Control Devices (MUTCD).

### **Category I Traffic Control Devices.**

Category I devices are defined as small, lightweight devices weighing less than 45 kg (99.2 lbs) known to be crashworthy from crash testing or years of demonstrable safe operational performance. These devices include plastic or rubber cones, tubular markers,

flexible delineators, and plastic drums with no lights, batteries, signs, etc. attached to the item.

### **Category I Submission Requirements:**

#### **Identical Design:**

- Complete drawings showing dimensions for the device, including welds or connecting hardware as appropriate. Detail the dimensions of each element of the device. Furnish the total weight of the device.
- Provide a brief written description of the device detailing the materials of each component, what the device's application will be and why the device is necessary.
- Submit copies of evaluations or engineering analysis performed on similar devices the device is being compared to. Detail the similarities and differences between the devices.
- A declaration from the submitter that they consider the device to be crashworthy based on either being built to specification for a device for which crashworthiness has been validated by crash or surrogate testing or; is a type of device that is considered crashworthy on the basis of crash test experience with similar devices or years of demonstrably safe operational performance.

#### **Nearly Identical Device:**

Submit the information required for identical devices and provide an Engineering analysis performed by an engineer experienced in crash testing work zone devices.

**Non-comparable device:** It is not expected that a non-comparable device would occur in this category.

### **Category II Traffic Control Devices.**

Category II devices are defined as small, light weight (less than 45 kg (99.2 lbs) devices that are not expected to produce significant vehicular velocity change, but may otherwise be potentially hazardous. All or parts of the device may be substantial enough to penetrate a windshield, injure a worker, or cause vehicle instability when driven over or become lodged under the vehicle.

Devices in this category would include barricades, portable sign supports, vertical panels, cones or barrels with lights attached, and intrusion detectors and alarms.

### **Category II Submission Requirements:**

#### **Identical Design:**

- Complete drawings showing dimensions for the device, including welds or connecting hardware as appropriate. Detail the dimensions of each element of the device. Furnish the total weight of the device.
- Provide a brief written description of the device detailing the materials of each component, what the device's application will be and why the device is necessary.

- Submit copies of evaluations or engineering analysis performed on similar devices the device is being compared to. Detail the physical and material similarities and differences between the devices.
- A declaration from the submitter that they consider the device to be crashworthy based on either being built to specification for a device for which crashworthiness has been validated by crash or surrogate testing or; is a type of device that is considered crashworthy on the basis of crash test experience with similar devices.

**Nearly Identical Device:**

Submit the information required for identical devices and provide an Engineering analysis performed by an engineer experienced in crash testing work zone devices.

**Non-comparable device:** Have the device crash tested and provide documentation the device was successfully crash tested meeting NCHRP 350 requirements.

**Category III Traffic Control Devices.**

These traffic control devices weigh more than 45 kg (99.2 lbs) and are expected to cause significant vehicular velocity change or other harmful reactions to impacting vehicles. The department will require all category III devices to have been successfully crash tested meeting NCHRP 350 requirements and for the contractor to furnish certification to the project manager under the contract requirements that the device meets NCHRP 350.

Type III traffic control devices will require successfully passing crash tests meeting NCHRP 350 and the department being provided documents showing the device passed. The department will accept the successful crash test results manufacturer's certification for approval of category III devices.

**Category IV Traffic Control Devices.**

FHWA has postponed the decision date for trailer mounted work zone devices such as changeable message signs, flashing arrow panels, portable traffic signals, temporary work zone lighting, etc. FHWA plans to make a determination of a requirement for crash testing of these devices possibly October 1, 2006.

MDT encourages the use of crashworthy Type IV devices and for contractors to replace non-crashworthy Type IV devices when older Type IV devices have reached their service life

Once the department has reviewed the information it will respond indicating more time is necessary to review the information; accept the device for use on highway projects, or disapprove the device and require crash testing meeting NCHRP 350 requirements before the device can be used. In the later case if the device is in use, the device must be removed from service and replaced with crashworthy devices on all state projects within 10 calendar days of receipt of the department letter.

If the department determines the device is acceptable for use on MDT projects, the contractor may use MDT's letter as evidence that the device is acceptable for use in Montana.

If the device is later found to not provide acceptable performance in the field, the department may modify or rescind the acceptance letter and require crash testing.